

REMARKS/ARGUMENTS

The Examiner is thanked for the Office Action mailed April 3, 2008. The status of the application is as follows:

- Claims 1-14 are pending, claims 1-5 and 9-14 have been amended, and claims 15-20 have been added;
- The specification is objected to;
- Claims 12-14 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter;
- Claims 1-2 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Rasche et al. (WO2002/103639 A2);
- Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Kachelriess et al. ("ECG-Correlated Imaging Reconstruction from subsecond multi-slice spiral CT scans of the heart", 2000, Medical Physics, Volume 27, Number 8, Page 1881);
- Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. (US 6,385,285);
- Claims 5-6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. and in further view of Chen et al. ("Kinematic and Deformation Analysis of 4-D Coronary Arterial Trees Reconstructed From Cine Angiograms", June 2003, IEEE, Volume 22, Number 6, Pages 710-721);
- Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. and Chen et al. and further in view of Flohr et al. (US 6,381,487);
- Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. and further in view of Grangeat et al. ("Theoretical framework for a dynamic cone-beam reconstruction algorithm based on a dynamic particle model", 17 July 2002, Phys. Med. Biol., Volume 47, Pages 2611-2625);
- Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Hsieh (US 6,529,575; and
- Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Hsieh and in further view of Vaillant et al. and Chen et al.

The objections and rejections are discussed below.

The Objection to the Specification

The specification is objected to for referencing claims 1-11. This objection should be withdrawn as the specification has been amended herein to cancel the references to the claims.

The specification is also objected to for incorporating a non-patent publication by reference. This objection should be withdrawn as the specification has been amended to include portions of the non-patent publication beginning with the section entitled “Image Reconstruction Under Motion” and ending with the section entitled “Reconstruction With a Hierarchical Motion Compensation”, pages 955-958, and no new matter has been added.

The Rejection of Claims 12-14 under 35 U.S.C. 101

Claims 12-14 stand rejected under 35 U.S.C. 101 as being directed towards non-statutory subject matter. The subject claims have been amended to include a computer readable medium with computer executable instructions stored thereon that causes a computer to perform various acts when the computer executes the instructions. It is believed that such amendments overcome the subject rejection. As such, withdrawal of the subject rejection is respectfully requested.

The Rejection of Claims 1-2 and 9-10 under 35 U.S.C. 102(b)

Claims 1-2 and 9-10 stand rejected under 35 U.S.C. 102(b) as being anticipated by Rasche et al. This rejection should be withdrawn because Rasche et al. does not teach each and every element as set forth in the subject claims and, therefore, does not anticipate claims 1-2 and 9-10.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987). MPEP §2131.

Amended **Independent claim 1** is directed towards a method that includes acquiring volumetric image data indicative of a moving organ during at least a sub-portion of a movement cycle of the moving organ, acquiring a signal indicative of the movement cycle, using a similarity measure to determine motion fields that describes motion of the moving organ during

Application No. 10/564,572
Amdt. Dated: July 25, 2008
Reply to Office Action Dated: April 3, 2008

the movement cycle based on the image data and the signal, wherein the similarity measure is a difference measure, determining where the motion is minimal based on the motion fields, selecting a portion of the image data that corresponds to where the motion is determined to be minimal, and reconstructing an image from the selected portion of the image data. Rasche et al. does not teach these claimed elements.

The Office cites to page 5, lines 28-30, of Rasche et al. to teach the claimed motion fields. (Office Action, page 5, the rejection of claim 2). However, page 5, lines 28-30, of Rasche et al. simply states that motion information, which provides information on the motion of the anatomy present in the examination zone during a cycle of motion, is derived from low-resolution 3D images. This section of Rasche et al. is silent regarding and does not teach or suggest motion fields that describe motion of a moving organ during a movement cycle of the object based on image data and the signal, wherein the similarity measure is a difference measure, let alone using a similarity measure to determine the motion fields, as recited in the subject claim.

In view of the foregoing, this rejection should be withdrawn.

Amended independent **claim 9** recites aspects similar to those recited in connection with claim 1. As such, the above discussion regarding claim 1 applies *mutatis mutandis* to claim 9, and this rejection should be withdrawn.

Claims 2 and 10 depend from claims 1 and 9, and are allowable at least by virtue of their dependencies.

The Rejection of Claim 3 under 35 U.S.C. 103(a)

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Kachelriess et al. **Claim 3** indirectly depends from claim 1, and is allowable at least by virtue of this dependency.

Application No. 10/564,572
Amdt. Dated: July 25, 2008
Reply to Office Action Dated: April 3, 2008

The Rejection of Claim 4 under 35 U.S.C. 103(a)

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. Amended **claim 4** recites that the similarity measure is a difference measure. The combination of Rasche et al. and Vaillant et al. does not teach or suggest this aspect. As such, this rejection should be withdrawn.

The Rejection of Claims 5-6 and 11 under 35 U.S.C. 103(a)

Claims 5-6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. and further in view of Chen et al. **Claims 5 and 6** indirectly depend from claim 1, and are allowable at least by virtue of their dependencies. **Claim 11** depends from claim 9, and is allowable at least by virtue of this dependency.

The Rejection of Claim 7 under 35 U.S.C. 103(a)

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. and Chen et al., and further in view of Flohr et al. **Claim 7** indirectly depends from claim 1, and is allowable at least by virtue of this dependency.

The Rejection of Claim 8 under 35 U.S.C. 103(a)

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Vaillant et al. and further in view of Grangeat et al. **Claim 8** indirectly depends from claim 1, and is allowable at least by virtue of this dependency.

The Rejection of Claims 12-13 under 35 U.S.C. 103(a)

Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Hsieh. Amended independent **claim 12** recites aspects similar to those recited in connection with claim 1. As such, the above discussion regarding claim 1 applies *mutatis mutandis* to claim 12, and this rejection should be withdrawn. Amended **claim 13**, which depends from claim 12, recites that the volumetric data correspond to cardiac CT data and simultaneously measured photoplethysmographic data. The combination of Rasche et al. Hsieh does not teach or suggest this claim aspect. Accordingly, the rejection of claim 13 should be withdrawn.

Application No. 10/564,572
Amdt. Dated: July 25, 2008
Reply to Office Action Dated: April 3, 2008

The Rejection of Claim 14 under 35 U.S.C. 103(a)

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rasche et al. in view of Hsieh, and further in view of Vaillant et al. and Chen et al. **Claim 14** depends from claim 12, and is allowable at least by virtue of this dependency.

New Claims 15-20

Newly added claims 15-20 emphasize various aspects. **Claim 15** requires that the plurality of motion fields describe inter-image motion. **Claims 16 and 19** require that the plurality of motion fields include a magnitude of the motion, which is based on a difference measure. **Claims 17 and 19** require that the plurality of motion fields include a magnitude of the motion, which is based on a similarity measure. **Claim 18** requires that the first time points be determined where the motion of the object is minimal by comparing the motion fields to a threshold. No new matter has been added. Entry and allowance of claims 15-20 is respectfully requested.

Application No 10/564,572
Amdt. Dated: July 25, 2008
Reply to Office Action Dated: April 3, 2008

Conclusion

In view of the foregoing, it is submitted that the claims distinguish patentably and non-obviously over the prior art of record. An early indication of allowability is earnestly solicited

Respectfully submitted,



Anthony M. Del Zoppo, III Reg. No. 51,606
Driggs, Hogg, Daugherty & Del Zoppo Co., L P A.
38500 Chardon Road
Willoughby Hills, Ohio 44094
Phone: 1 440.391.5100
Fax: 1 440.391.5101

Direct all correspondence to:

Douglas B. McKnight, Reg. No. 50,447
Philips Intellectual Property & Standards
595 Miner Road
Cleveland, Ohio 44143
Phone: 1 440.483.2373
Fax: 1 440.483.2452